

NCI: Thyroid FNA Conference

Category III: Items - C, D, E & F

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General Comments: Items C – F from Rounds 1 & 2

- Most comments were personalized to experience and methodological preferences found in the document for Category III
- A few comments cited additional, pertinent information and some references
- Rare comments elicited emotional and yet cogent responses

Item C: Influence of lesion location, size and imaging characteristics on FNA technique

Item C issues: presumes that an “accurate” diagnostic ultrasound has been reported BUT, the thyroid and neck must be reimaged at the time of UGFNA performance

WHY IS REIMAGING RELEVANT?

- avoidance of sampling error in cystic (complex) nodules
- detect presence of additional nodule(s) for which FNA may be indicated
- detect additional imaging characteristics which may influence decision to perform or not to perform UGFNA

(Brander, Tan, Marqusee, Papini, Leenhardt)

Item C: Influence of lesion location, size and imaging characteristics on FNA technique

LOCATION

- Within the thyroid gland, the location does not contribute significantly to a non-diagnostic aspirate performed under ultrasound guidance. UGFNA of 1458 nodules revealed 189 were “non-diagnostic”. Multivariate analysis revealed that the only significant variant was the cystic component of the nodule

(Alexander)

Item C: Influence of lesion location, size and imaging characteristics on FNA technique

SIZE as a criteria for UGFNA (4 Guidelines)

- Size
American Thyroid Association (2006)
- Size + Imaging Features
Society of Radiologists in Ultrasound (2005)
- Size + Imaging Features + Clinical/Family History
American Association of Clinical Endocrinologists (2006)
European Consensus (2006)

(Cooper, Frates, Gharib, Pacini)

Item C: Influence of lesion location, size and imaging characteristics on FNA technique

SIZE as a criteria for UGFNA (4 Guidelines)

- Thus, only 1 of 4 orgs use size alone as a definitive criteria for UGFNA
- All 4 orgs agree UGFNA may be indicated for nodules >1-1.5 cm
- Therefore, size issue related to nodules <1-1.5 cm with suspicious imaging findings suggestive of a possible microcarcinoma

Item C: SIZE - Microcarcinoma (<1-1.5 cm)

FACTS

- 1) Autopsy series: 6% (3-11%) have an incidental microcarcinoma (approx 90+% micro PTC)
- 2) Equal F:M prevalence and no age related increase
- 3) About 12 million people in USA with micro PTC (est. 6% x 200 million > 25 y/o as of 7/2007 population)
- 4) Mortality rate for surgically treated microcarcinomas is 1-2/1000 pts from multiple large series
- 5) No difference in malignancy rates for nodules > or < 1-1.5 cm

Item C: SIZE - Microcarcinoma (<1-1.5 cm) PROBLEMS

- 1) Currently, most microcarcinomas are diagnosed by UGFNA due to suspicious imaging characteristics or at thyroidectomy for another cause
- 2) In order to prevent 1-2 deaths from UGFNA diagnosed microPTC, 1000 patients would have to undergo thyroidectomies

Item C: SIZE - Microcarcinoma (<1-1.5 cm) PROBLEMS

CLEARLY, DIFFERENT ASSESSMENT
PARAMETERS ARE NEEDED FOR DECISION
MAKING TO PERFORM UGFNA ON NODULES
< 1 CM WITH ONE OR MORE SUSPICIOUS
IMAGING CHARACTERISTICS

Item C: SIZE - Microcarcinoma (<1-1.5 cm) PROBLEMS

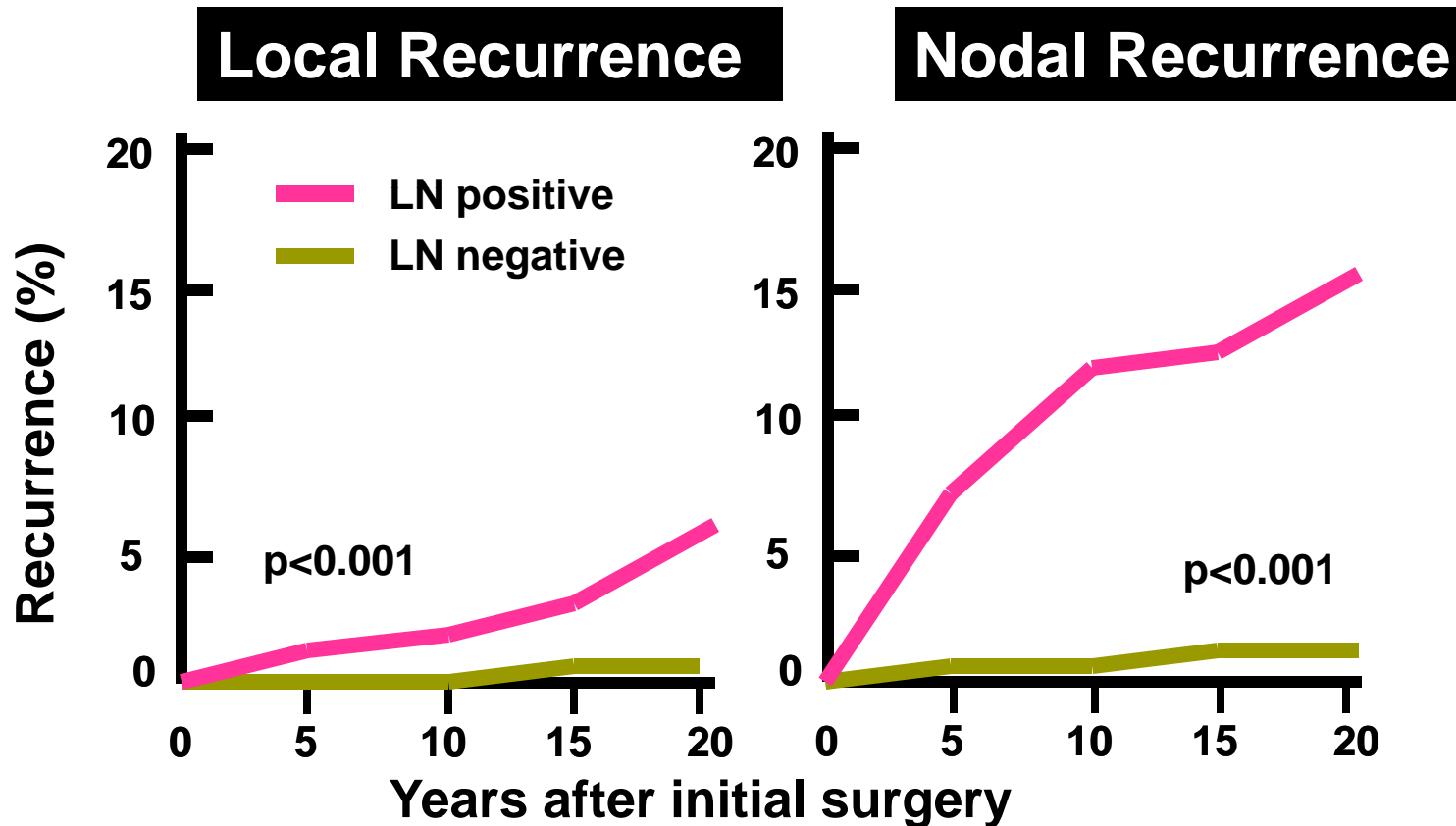
QUESTION:

ARE THERE ANY OTHER SUSPICIOUS IMAGING CHARACTERISTICS THAT CAN AID IN DECISION MAKING TO PERFORM OR NOT PERFORM UGFNA ON A < 1-1.5 CM NODULE?

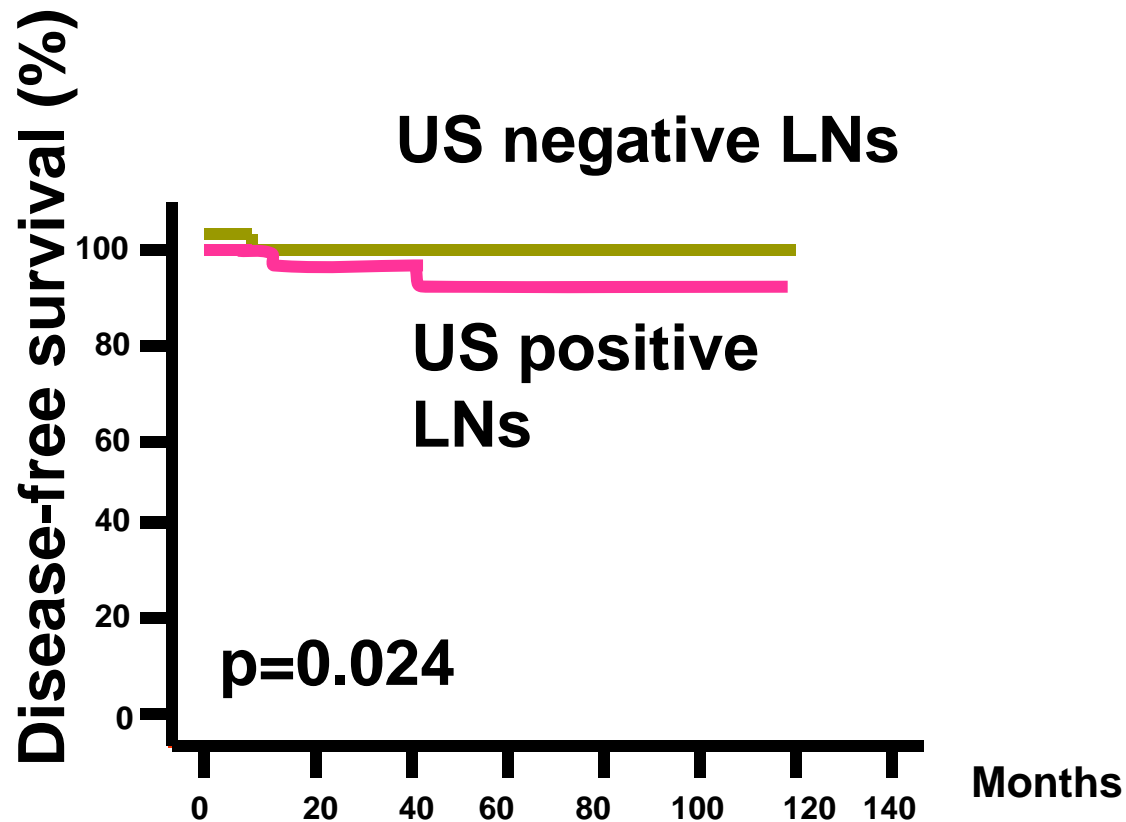
ANSWER:

LATERAL NECK LYMPH NODES ARE PREDICTORS OF OUTCOME (RECURRENCE AND DEATH) FOR MICROPAPILLARY THYROID CANCER

Clinical Lymph Node (LN) Metastases at Presentation: **WORSE** Outcome

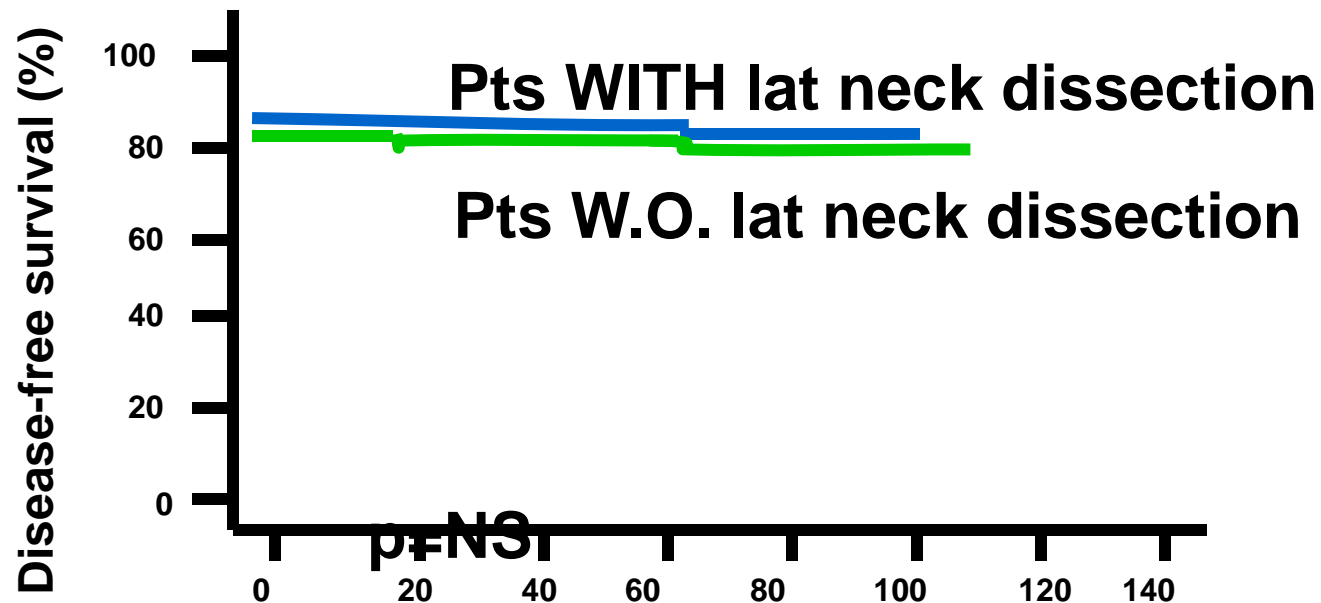


US DETECTED lateral LN Metastases at Presentation: WORSE outcome



US Detects about 40% of Pathologically Abnormal LNs

US (-), PATHOLOGY (+) LN Metastases:
NO IMPACT on Outcome



Other Poor Prognostic Indicators in Papillary Microcarcinoma

- Extrathyroidal extension
- Nonencapsulated tumor
- Multifocality

Item C: Influence of lesion location, size and imaging characteristics on FNA technique

Comment: A nodule's cystic component affects UGFNA non-diagnostic rates:

- solid	8%
- 25-50% cystic	12%
- 50-75% cystic	25%
- > 75% cystic	36%

(Alexander)

Diagnostic Ultrasound: Characteristics suggestive of Malignant Nodules

- Hypoechoic and/or heterogenous texture
- Irregular or blurred border
- Microcalcifications without shadowing
- Amorphous calcifications with shadowing – less common
- Taller than wider
- Doppler (CFD): intranodular vascular pattern
- Cyst with mural tissue or thick wall
- Invasion of surrounding tissues/structures
- Cervical adenopathy (pathologic)

Item C: Influence of lesion location, size and imaging characteristics on FNA technique

Conclusions:

- 1. All ultrasound imaged nodules, regardless of location, are potential candidate nodules for biopsy
- 2. All nodules, $> 1\text{-}1.5$ cm and based on suspicious or risk associated imaging characteristics may be considered for biopsy
- 3. Nodules $< 1\text{-}1.5$ cm with or without risk associated imaging characteristics may be monitored over time if there is no associated personal or family history of

Item C: Influence of lesion location, size and imaging characteristics on FNA technique

Conclusions:

increased risk; and no grossly abnormal nodules or lymph nodes by physical exam and realtime ultrasonography

- 4. Cystic thyroid nodules (eg > 25 - 50 % central fluid) should be considered for drainage prior to UGFNA of any residual nodular tissue imaged by ultrasound

Item D. The role of ultrasound guidance in FNA of a palpable thyroid nodule

- UGFNA of all palpable nodules (< 1.5 to 4 cm+) results in a 2-3 fold reduction in “non-diagnostic” or “inadequate” aspirates
- UGFNA optimizes needle placement in the tissue portion of cystic nodules (post fluid drainage if needed)
- UGFNA optimizes needle placement in the tissue portion of complex nodules (multi compartment or “honeycomb”, cystic and solid nodules)

Item D. The role of ultrasound guidance in FNA of a palpable thyroid nodule

- UGFNA of a palpable nodule allows for recognition and aspiration of alternative suspicious thyroid nodules or lymph nodes (usually nonpalpable)
- UGFNA of a palpable nodule reduces the number of false negative reports
- UGFNA improves aspiration of tissue for cytologic interpretation for repeat of previously performed non-diagnostic aspirates

(> 40 references)

Item D. The role of ultrasound guidance in FNA of a palpable thyroid nodule

■ Conclusions:

1. US guidance of palpable thyroid nodules reduces the rate of inadequate aspirations and false negative biopsies especially when the lesions are small, predominately cystic, located deep within the thyroid or have been previously biopsied and “nondiagnostic”

Item D. The role of ultrasound guidance in FNA of a palpable thyroid nodule

■ Conclusions:

2. UGFNA of palpable thyroid nodules improves accuracy and increases detection of thyroid cancer when the lesions are small, predominately cystic, located deep within the thyroid or have been previously rendered “nondiagnostic”.

Item D. The role of ultrasound guidance in FNA of a palpable thyroid nodule

■ Conclusions:

3. US guidance will likely increase the number of lesions identified and increase the number of biopsies resulting in the “appropriate” selection of surgical referrals for papillary thyroid cancer as well as follicular neoplasms since the differentiation between benign and malignant follicular neoplasms requires histology

Item E. The role of core biopsy (CNB) for palpable and non-palpable thyroid nodules

- Core Needle Biopsy (CNB) 14-18g
 - 16-18 g large bore needle
 - cutting needles (eg Vim-Silverman, True-Cut)
 - spring-loaded single and double action CNB
 - a) single action (eg Temno and similar): needle advanced into nodule and cutting sheath is then deployed
 - b) double action (eg BioPince, Biopty and similar): needle deployed with 11-33 mm excursion and second cutting sheath or blade rapidly deployed in sequence.

Item E. The role of core biopsy (CNB) for palpable and non-palpable thyroid nodules

■ CNB vs FNA

- Histologic vs cytologic tissue
- CNB requires local anesthesia; increased risk of bleeding and hematoma formation; increased risk for vascular, nerve, airway and esophagus injury; not used for <1.5 cm nodules
- edge to CNB obtaining an interpretable biopsy when FNA is ND
- both CNB and FNA have improved outcomes with use of UG
- PROBLEM: neither helpful in differentiating benign from malignant follicular lesions
- FNA and CNB not competitive but complementary

> 30 references

Item E. The role of core biopsy (CNB) for palpable and non-palpable thyroid nodules

Conclusions:

- UGFNA is best technique overall – efficacy, safety, availability
- UGCNB complementary and most beneficial for diagnosing benign nodule after repeat UGFNA
- Neither UGCNB or UGFNA can differentiate follicular adenoma from follicular carcinoma

Item F. Advantages and disadvantages to various specialists performing FNA of palpable thyroid nodules

Assuming equal capabilities among specialists in technique/performance of FNA:

- No advantage to any specialists performing FNA without ultrasound guidance
- Advantage to all specialists performing UGFNA for all nodules
- Disadvantage to specialist not utilizing ultrasound guidance

Item F. Advantages and disadvantages to various specialists performing FNA of palpable thyroid nodules

Conclusion:

Optimal specialist for the performance of FNA of palpable or nonpalpable nodules is experienced in diagnostic and UGFNA; has repeatedly exercised appropriate judgment in nodule selection; and, has consistently demonstrated technical excellence and proficiency in obtaining aspirate material and preparing slides